

# This Week in SM311P:1001: Homework, etc.

Homework must be submitted stapled in assignment groupings.

Always attempt to complete the readings before class. You are responsible for reading 10 pages past the current lecture. You may not understand the material completely, but you must read it prior to lecture.

\*\* Problems to submit on the date listed: \*\*

Week of 17 Nov

Monday

E&M Int.: 1, 3, 4; Read Boas: Line integrals, p257 ff

Read Vector Calculus Tools of the Trade:

**Line Integrals parameterizing the curve**  
begins around page 35.

Wednesday:

VC33 and

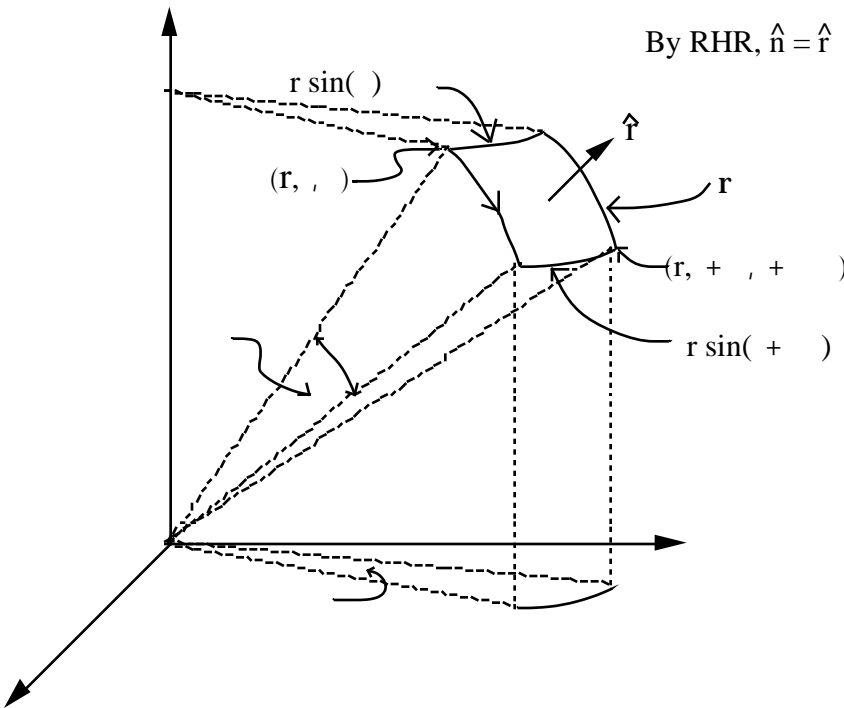
Boas #6 page 264 (Vector Analysis Sec. 8)

Is the integral path independent ? Compute curl F

Friday:

33.)

Figure for Radial Component of the Curl



Compute:

$\vec{v} \cdot d\vec{r}$  for the path shown

with  $\phi = \pi/4$  and  $\theta = \pi/6$

$\phi = \pi/12$

$\pi/4 < \phi < \pi/6$

$\pi/4 < \theta < \pi/6$

$$\vec{v} = \frac{\theta}{\sin\theta} \hat{\phi} - \phi \hat{\theta}$$

Steps to include:

a.) Expression for  $d\vec{r}$  in spherical coordinates

b.) Expression for  $\vec{v} \cdot d\vec{r}$  given  $\vec{v} = \frac{\theta}{\sin\theta} \hat{\phi} - \phi \hat{\theta}$ .

c.) The line integral as a four segment integral with limits for each leg.

d.) The statement of Green's theorem.

e.) The expression for  $dA_r$  in spherical coordinates.

f.) The expression for  $[\vec{r} \times \vec{v}]_r$  with its careful evaluation.

g.)  $[\vec{r} \times \vec{v}] \cdot \hat{r} dA_r$  carefully expressed and then evaluated for the patch designated.